



July 08, 2014

Mr. Danny O'Connor
Tetra Tech Inc.
415 Oak Street
Kansas City, Missouri 64106

Re: C14 Analysis for BetaChem Site
Work Order: 351556

Dear Mr. O'Connor:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 28, 2014. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4505.

Sincerely,

Heather Shaffer
Project Manager

Purchase Order: 1105919
Enclosures

**Receipt Narrative
for
Tetra Tech, Inc. (BetaChem 1105919)
SDG: 351556**

July 08, 2014

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 28, 2014 for analysis.

Sample Identification: The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
351556001	Bulked Flammables
351556002	Bulked Flammables

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: GC Semivolatile PCB, GC/MS Semivolatile, GC/MS Volatile, General Chemistry and Metals.

Heather Shaffer

Heather Shaffer
Project Manager

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Chain of Custody and Supporting Documentation

CHAIN-OF-CUSTODY RECORD

351556



TETRA TECH EM INC.

8030 Flint Street
Lenexa, Kansas 66214
(913) 894-2600

Date: 6-24-14
Page: 1 of 1
Project No: X9025140061
Shipment Method: FedEx
Number of Coolers Shipped: 1

Project Name: <u>Beta-Chem</u>			Analyses (Preservative)										Matrix Type	No. of Containers	Turn-around Time Requested:
Project Manager: <u>Danny O'Connor</u>			TCLP Metals	TCLP VOCs	TCLP SVOCs	PCBs	pH	Flashpoint	Total Halogens	BTUs					
Sampler: <u>[Signature]</u> (Signature)			Sample Number:	Date:	Time:										Laboratory Comments:
<u>Bulked Flammables</u>			<u>6/23/14</u>			X	X	X	X	X	X	X	X	4	
<div style="text-align: center;"> <p><u>Danny O'Connor</u></p> <p><u>6-24-14</u></p> </div>															

Matrix: S = Soil M = Sediment W = Water A = Air
Preservatives: 1 = Ice 2 = HCl 3 = H₂SO₄ 4 = NaOH 5 = HNO₃

Relinquished By: <u>[Signature]</u> (Signature)	Received By: <u>[Signature]</u> (Signature)	Date: <u>6-28-14</u>	Time: <u>0910</u>
Relinquished By: <u>[Signature]</u> (Signature)	Received By: <u>[Signature]</u> (Signature)	Date:	Time:
Relinquished By: <u>[Signature]</u> (Signature)	Received By: <u>[Signature]</u> (Signature)	Date:	Time:

SAMPLE RECEIPT & REVIEW FORM

Client: <u>TEHLA</u>		SDG/AR/COC/Work Order: <u>351506</u>	
Received By: <u>mk</u>		Date Received: <u>6-13-14</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>cpm 0</u>	
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?	
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>		
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.	
Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	Hazard Class Shipped: <u>3</u>	UN#: <u>1993</u>
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>		

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Ice bags Blue ice Dry ice None Other (describe) <u>25°C</u> *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>30531776</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: <u>NO TIME ON CHAIN - 1100 on Bottles</u>
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>8053 6256 3513</u>

Comments (Use Continuation Form if needed):

Laboratory Certifications

List of current GEL Certifications as of 08 July 2014

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-14-9
Utah NELAP	SC000122014-13
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

Volatile Analysis

Case Narrative

**ChemStation Case Narrative
Tetra Tech, Inc. (TETR)
SDG 351556**

Method/Analysis Information

Procedure:	Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer
Analytical Method:	SW846 8260B
Prep Method:	SW846 1311
Analytical Batch Number:	1400034
Prep Batch Number:	1397183

Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

Sample ID	Client ID
351556001	Bulked Flammables
1203119591	Method Blank (MB)
1203119594	Laboratory Control Sample (LCS)
1203119741	351556001(Bulked Flammables) Post Spike (PS)
1203119742	351556001(Bulked Flammables) Post Spike Duplicate (PSD)
1203120615	Method Blank (MB)
1203120617	Laboratory Control Sample (LCS)

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP) section 19.1.2. False positive analytes are designated on the quantitation report with a 'd' qualifier.

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package.

The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification Requirements

All associated calibration verification standard(s) (CCV) met the acceptance criteria.

Quality Control (QC) Information

Blank (MB) Statement

The blanks analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

Surrogate recoveries in all client and quality control samples were within the acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 351556001 (Bulked Flammables) was designated for spike analysis.

Matrix Spike (PS) Recovery Statement

The spike 1203119741 (Bulked Flammables) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

Matrix Spike Duplicate (PSD) Recovery Statement

The spike duplicate 1203119742 (Bulked Flammables) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

Relative Percent Difference (RPD) Statement

The RPDs between the matrix spike pair met the acceptance limits.

Internal Standard (ISTD) Acceptance

The internal standard responses in all client and quality control samples met the required acceptance criteria.

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Sample Preservation and Integrity

All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

Due to problems associated with the nature of the TCLP matrix, volatile extracts are routinely diluted before analysis. The dilution factor does not increase detection limits above the regulatory limits required by the client.

Sample 351556001 (Bulked Flammables) was diluted because target analyte concentrations exceeded the calibration range.

Sample Re-extraction/Re-analysis

Re-analyses were not required for samples in this SDG.

Miscellaneous Information

Data Exception (DER) Documentation

The following DER was generated for this SDG: 1311186.

Manual Integrations

Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

TIC Comment

Tentatively identified compounds (TIC) were not required for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

Residual Chlorine was not detected in any of the samples in this SDG.

System Configuration

The Volatile-GC/MS analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOAA.I	Agilent 7890/5975 GC/MS w/ OI Eclipse/Archon Autosampler	HP7890A/HP5975C	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

TETR056 Tetra Tech, Inc. (BetaChem 1105919)

Client SDG: 351556 GEL Work Order: 351556

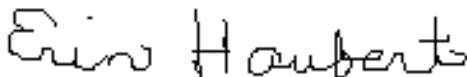
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- E Concentration of the target analyte exceeds the instrument calibration range
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Erin Haubert

Date: 07 JUL 2014

Title: Data Validator

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 3, 2014

Company : Tetra Tech Inc.
Address : 415 Oak Street

Kansas City, Missouri 64106

Contact: Mr. Danny O'Connor
Project: C14 Analysis for BetaChem Site

Client Sample ID: Bulkled Flammables

Project: TETR00056

Sample ID: 351556001

Client ID: TETR056

Matrix: Misc Liquid

Collect Date: 23-JUN-14 11:00

Receive Date: 28-JUN-14

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
TCLP Volatiles in Liquid "As Received"											
1,1-Dichloroethylene	U	ND	75.0	250	mg/L	2.50E+05	JEB	07/01/14	2217	1400034	1
1,2-Dichloroethane	U	ND	75.0	250	mg/L	2.50E+05					
1,4-Dichlorobenzene	U	ND	75.0	250	mg/L	2.50E+05					
2-Butanone	U	ND	375	1250	mg/L	2.50E+05					
Benzene	E	26500	75.0	250	mg/L	2.50E+05					
Carbon tetrachloride	U	ND	75.0	250	mg/L	2.50E+05					
Chlorobenzene	U	ND	75.0	250	mg/L	2.50E+05					
Chloroform		390	75.0	250	mg/L	2.50E+05					
Tetrachloroethylene	U	ND	75.0	250	mg/L	2.50E+05					
Trichloroethylene	U	ND	75.0	250	mg/L	2.50E+05					
Vinyl chloride	U	ND	75.0	250	mg/L	2.50E+05					
1,1-Dichloroethylene	U	ND	150	500	mg/L	5.00E+05	JEB	07/02/14	1137	1400034	2
1,2-Dichloroethane	U	ND	150	500	mg/L	5.00E+05					
1,4-Dichlorobenzene	U	ND	150	500	mg/L	5.00E+05					
2-Butanone	U	ND	750	2500	mg/L	5.00E+05					
Benzene		28700	150	500	mg/L	5.00E+05					
Carbon tetrachloride	U	ND	150	500	mg/L	5.00E+05					
Chlorobenzene	U	ND	150	500	mg/L	5.00E+05					
Chloroform	J	420	150	500	mg/L	5.00E+05					
Tetrachloroethylene	U	ND	150	500	mg/L	5.00E+05					
Trichloroethylene	U	ND	150	500	mg/L	5.00E+05					
Vinyl chloride	U	ND	150	500	mg/L	5.00E+05					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 1311	SW846 1311 TCLP Volatiles Prep	MXC2	06/30/14	1450	1399526

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	
2	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	TCLP Volatiles in Liquid "As Received"	13200 mg/L	0.050	106	(78%-124%)
Bromofluorobenzene	TCLP Volatiles in Liquid "As Received"	12400 mg/L	0.050	99.5	(80%-120%)
Toluene-d8	TCLP Volatiles in Liquid "As Received"	12500 mg/L	0.050	99.6	(80%-120%)
1,2-Dichloroethane-d4	TCLP Volatiles in Liquid "As Received"	25600 mg/L	0.050	102	(78%-124%)

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 3, 2014

Company : Tetra Tech Inc.
Address : 415 Oak Street

Contact: Kansas City, Missouri 64106
Project: Mr. Danny O'Connor
C14 Analysis for BetaChem Site

Client Sample ID: Bulked Flammables
Sample ID: 351556001

Project: TETR00056
Client ID: TETR056

Bromofluorobenzene	TCLP Volatiles in Liquid "As Received"	23100 mg/L	0.050	92.4	(80%-120%)
Toluene-d8	TCLP Volatiles in Liquid "As Received"	23300 mg/L	0.050	93.0	(80%-120%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: July 3, 2014

Page 1 of 6

Tetra Tech Inc.
415 Oak Street
Kansas City, Missouri

Contact: Mr. Danny O'Connor

Workorder: 351556

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1400034										
QC1203119594	LCS										
1,1-Dichloroethylene	0.050			0.0445	mg/L		89	(80%-128%)	JEB	07/01/14	14:55
1,2-Dichloroethane	0.050			0.0461	mg/L		92.2	(73%-120%)			
1,4-Dichlorobenzene	0.050			0.0445	mg/L		88.9	(78%-120%)			
2-Butanone	0.250			0.255	mg/L		102	(57%-148%)			
Benzene	0.050			0.0436	mg/L		87.1	(78%-120%)			
Carbon tetrachloride	0.050			0.0544	mg/L		109	(80%-131%)			
Chlorobenzene	0.050			0.0446	mg/L		89.2	(79%-120%)			
Chloroform	0.050			0.0473	mg/L		94.6	(79%-120%)			
Tetrachloroethylene	0.050			0.0475	mg/L		95	(74%-123%)			
Trichloroethylene	0.050			0.0464	mg/L		92.7	(80%-121%)			
Vinyl chloride	0.050			0.0512	mg/L		102	(59%-127%)			
**1,2-Dichloroethane-d4	50.0			51.6	ug/L		103	(78%-124%)			
**Bromofluorobenzene	50.0			48.2	ug/L		96.3	(80%-120%)			
**Toluene-d8	50.0			48.1	ug/L		96.2	(80%-120%)			
QC1203120617	LCS										
1,1-Dichloroethylene	0.050			0.0498	mg/L		99.6	(80%-128%)		07/02/14	01:08
1,2-Dichloroethane	0.050			0.0559	mg/L		112	(73%-120%)			
1,4-Dichlorobenzene	0.050			0.0507	mg/L		101	(78%-120%)			
2-Butanone	0.250			0.233	mg/L		93	(57%-148%)			
Benzene	0.050			0.0514	mg/L		103	(78%-120%)			
Carbon tetrachloride	0.050			0.0605	mg/L		121	(80%-131%)			

GEL LABORATORIES LLC

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QC Summary

Workorder: 351556

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1400034										
Chlorobenzene	0.050			0.0521	mg/L		104	(79%-120%)	JEB	07/02/14	01:08
Chloroform	0.050			0.0557	mg/L		111	(79%-120%)			
Tetrachloroethylene	0.050			0.0529	mg/L		106	(74%-123%)			
Trichloroethylene	0.050			0.0534	mg/L		107	(80%-121%)			
Vinyl chloride	0.050			0.0468	mg/L		93.7	(59%-127%)			
**1,2-Dichloroethane-d4	50.0			53.4	ug/L		107	(78%-124%)			
**Bromofluorobenzene	50.0			50.4	ug/L		101	(80%-120%)			
**Toluene-d8	50.0			50.3	ug/L		101	(80%-120%)			
QC1203119591 MB											
1,1-Dichloroethylene			U	ND	mg/L					07/01/14	16:09
1,2-Dichloroethane			U	ND	mg/L						
1,4-Dichlorobenzene			U	ND	mg/L						
2-Butanone			U	ND	mg/L						
Benzene			U	ND	mg/L						
Carbon tetrachloride			U	ND	mg/L						
Chlorobenzene			U	ND	mg/L						
Chloroform			U	ND	mg/L						
Tetrachloroethylene			U	ND	mg/L						
Trichloroethylene			U	ND	mg/L						
Vinyl chloride			U	ND	mg/L						
**1,2-Dichloroethane-d4	50.0			48.1	ug/L		96.1	(78%-124%)			
**Bromofluorobenzene	50.0			48.0	ug/L		96.1	(80%-120%)			

GEL LABORATORIES LLC

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QC Summary

Workorder: 351556

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1400034										
**Toluene-d8	50.0			48.3	ug/L		96.6	(80%-120%)	JEB	07/01/14	16:09
QC1203120615 MB											
1,1-Dichloroethylene			U	ND	mg/L					07/02/14	02:21
1,2-Dichloroethane			U	ND	mg/L						
1,4-Dichlorobenzene			U	ND	mg/L						
2-Butanone			U	ND	mg/L						
Benzene			U	ND	mg/L						
Carbon tetrachloride			U	ND	mg/L						
Chlorobenzene			U	ND	mg/L						
Chloroform			U	ND	mg/L						
Tetrachloroethylene			U	ND	mg/L						
Trichloroethylene			U	ND	mg/L						
Vinyl chloride			U	ND	mg/L						
**1,2-Dichloroethane-d4	50.0			49.1	ug/L		98.1	(78%-124%)			
**Bromofluorobenzene	50.0			49.2	ug/L		98.5	(80%-120%)			
**Toluene-d8	50.0			49.2	ug/L		98.5	(80%-120%)			
QC1203119741 351556001 PS											
1,1-Dichloroethylene	50.0	U	ND	50.0	ug/L		100	(74%-130%)		07/01/14	23:30
1,2-Dichloroethane	50.0	U	ND	E	132	ug/L	265 *	(68%-128%)			
1,4-Dichlorobenzene	50.0	U	ND		44.0	ug/L	88.1	(70%-120%)			
2-Butanone	250	U	ND	E	801	ug/L	320 *	(38%-136%)			
Benzene	50.0	E	106	E	156	ug/L	99.6	(75%-120%)			
Carbon tetrachloride	50.0	U	ND		58.6	ug/L	117	(76%-132%)			

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QC Summary

Workorder: 351556

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1400034										
Chlorobenzene	50.0	U	ND	48.1	ug/L		96.2	(74%-120%)	JEB	07/01/14	23:30
Chloroform	50.0		1.56	55.7	ug/L		108	(75%-123%)			
Tetrachloroethylene	50.0	U	ND	49.2	ug/L		98.4	(67%-124%)			
Trichloroethylene	50.0	U	ND	51.0	ug/L		102	(75%-125%)			
Vinyl chloride	50.0	U	ND	48.1	ug/L		96.3	(52%-129%)			
**1,2-Dichloroethane-d4	50.0		53.0	53.4	ug/L		107	(78%-124%)			
**Bromofluorobenzene	50.0		49.8	49.9	ug/L		99.9	(80%-120%)			
**Toluene-d8	50.0		49.8	49.8	ug/L		99.6	(80%-120%)			
QC1203119742 351556001 PSD											
1,1-Dichloroethylene	50.0	U	ND	50.1	ug/L	0.080	100	(0%-20%)		07/01/14	23:55
1,2-Dichloroethane	50.0	U	ND	E	134	ug/L	1.08	268 *		(0%-20%)	
1,4-Dichlorobenzene	50.0	U	ND		48.9	ug/L	10.5	97.8		(0%-20%)	
2-Butanone	250	U	ND	E	785	ug/L	1.95	314 *		(0%-20%)	
Benzene	50.0	E	106	E	161	ug/L	3.22	110		(0%-20%)	
Carbon tetrachloride	50.0	U	ND		58.9	ug/L	0.545	118		(0%-20%)	
Chlorobenzene	50.0	U	ND		50.0	ug/L	3.81	100		(0%-20%)	
Chloroform	50.0		1.56	55.7	ug/L	0.0718	108	(0%-20%)			
Tetrachloroethylene	50.0	U	ND	50.4	ug/L	2.41	101	(0%-20%)			
Trichloroethylene	50.0	U	ND	51.6	ug/L	1.27	103	(0%-20%)			
Vinyl chloride	50.0	U	ND	48.4	ug/L	0.580	96.8	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		53.0	52.6	ug/L		105	(78%-124%)			
**Bromofluorobenzene	50.0		49.8	49.8	ug/L		99.5	(80%-120%)			

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QC Summary

Workorder: 351556

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1400034										
*Toluene-d8	50.0	49.8		49.6	ug/L		99.1	(80%-120%)	JEB	07/01/14	23:55

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B The target analyte was detected in the associated blank.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- E Concentration of the target analyte exceeds the instrument calibration range
- H Analytical holding time was exceeded
- J Value is estimated
- JNX Non Calibrated Compound
- N Organics--Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
- N Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- P Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, the difference is >70%.
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UJ Compound cannot be extracted
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 03-JUL-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: VOA GC/MS	Test / Method: SW846 8260B	Matrix Type: Liquid	Client Code: TETR, ZEUS
Batch ID: 1400034	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 351556 Application Issues: Failed Recovery for MS/PS Failed Recovery for MSD/PSD			
Specification and Requirements		DER Disposition:	
Exception Description:			
The MS 1203119741 & MSD 1203119742 did not meet spike recovery limits for 1,2-Dichloroethane and 2-Butanone. The MS recovered 1,2-Dichloroethane at 264.8% and 2-Butanone at 320.4%. The MSD recovered 1,2-Dichloroethane at 267.6% and 2-Butanone at 314.2%.		The spike and spike duplicate did not meet the acceptance limits. The results between the spike and spike duplicate were similar. Matrix interference has been demonstrated.	

Originator's Name:

John Bell, Jr. 03-JUL-14

Data Validator/Group Leader:

Kelle Bellamy 03-JUL-14

Semi-Volatile Analysis

Case Narrative

**Semi-Volatile Case Narrative
Tetra Tech, Inc. (TETR)
SDG 351556**

Method/Analysis Information

Procedure:	Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry
Analytical Method:	SW846 3580A/8270D
Prep Method:	SW846 3580A
TCLP Prep Method :	SW846 1311
Analytical Batch Number:	1400389
Prep Batch Number:	1400388
TCLP Prep Batch Number:	1400302

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3580A/8270D:

Sample ID	Client ID
351556002	Bulked Flammables
1203120172	TCLP Blank (TB)
1203120348	Method Blank (MB)
1203120349	351556002(Bulked Flammables) Matrix Spike (MS)
1203120350	351556002(Bulked Flammables) Matrix Spike Duplicate (MSD)
1203120351	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-009 REV# 32.

Raw data reports are processed and reviewed by the analyst using the data analysis software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

CCV Requirements

All Calibration Verification Standards (CCV) did not meet the acceptance criteria as outlined in Method 8270D. However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. Detected concentrations of these analytes should be considered as estimated.

Quality Control (QC) Information

Method Blank (MB) Statement

The TCLP Blank, 1203120172 (TB), is a TCLP Blank that is tumbled or filtered and extracted with the batch. The Method Blank, 1203120348 (MB), is a method blank and was extracted only. Target analytes were not detected in the TB or MB associated with this batch.

Surrogate Recoveries

Samples 1203120172 (TB), 1203120348 (MB) and 1203120351 (LCS) displayed failing surrogate recoveries. Please see the QC Summary/Surrogate Recovery Report for the specific failures. The samples were waste dilution analyses. They were diluted to a known volume and analyzed directly. Because they were not extracted (extracted compounds may be consumed or lost during the process), the recoveries are typically higher.

Samples 1203120349 (Bulked Flammables), 1203120350 (Bulked Flammables) and 351556002 (Bulked Flammables) failed surrogate recovery limits. Please see the QC Summary/Surrogate Recovery Report for specific failures. Surrogate recoveries were not within the acceptance limit. The associated spike and spike duplicate recovered in a similar manner. Matrix interference has been demonstrated and the samples were analyzed at a further dilution. The data are reported.

Laboratory Control Sample (LCS) Recovery

The 1203120351 (LCS) displayed failing spike recoveries. The sample was a waste dilution analysis. It was diluted to a known volume and analyzed directly. Because it was not extracted (extracted compounds may be consumed or lost during the process), the recoveries are typically higher.

QC Sample Designation

Sample 351556002 (Bulked Flammables) was selected for analysis as the matrix spike and matrix spike duplicate.

Matrix Spike (MS) Recovery Statement

The MS, 1203120349 (Bulked Flammables), recoveries were not within the acceptance limits. The failures confirmed in the MSD and were attributed to matrix interference and that the MS was analyzed at a dilution. The data are reported.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD, 1203120350 (Bulked Flammables), recoveries were not within the acceptance limits. The failures confirmed in the MS and were attributed to matrix interference and that the MSD was analyzed at a dilution. The data are reported.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD values between the MS and MSD met the acceptance limits.

Internal Standard (ISTD) Acceptance

The internal standard responses used to quantitate the requested target analytes were within the required acceptance criteria for the SDG associated samples in this batch.

Technical Information:**Holding Time Specifications**

All samples in this SDG in this batch met the specified holding time. GEL assigns holding times based on the associated methodology that assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP. All reported compound mass spectra met the detection specifications in the method.

Sample Dilutions

Samples 1203120349 (Bulked Flammables), 1203120350 (Bulked Flammables) and 351556002 (Bulked Flammables) were diluted due to the presence of non-target analytes. The data from the dilutions are reported. Samples 1203120349 (Bulked Flammables), 1203120350 (Bulked Flammables) and 351556002 (Bulked Flammables) were diluted due to the presence of one or more over-range target analytes. The data from the dilutions are reported.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception report 1311857 was generated for the samples in this batch for this SDG.

Manual Integrations

Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations. Manual integrations, if any, are included with the raw data.

TIC Comment

Tentatively identified compounds (TIC) were not required for the samples in this SDG for this batch.

Additional Comments

Additional comments were not required for the SDG associated samples in this batch.

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

System Configuration

The Semi-Volatile-GC/MS analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
MSD4.I	Agilent 7890A/5975C GC/MS w/ 7683 Autosampler	HP6890/HP5973	DB-5MS	25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane)

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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Qualifier Definition Report for

TETR056 Tetra Tech, Inc. (BetaChem 1105919)

Client SDG: 351556 GEL Work Order: 351556

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Herbert Maier

Date: 08 JUL 2014

Title: Data Validator

Sample Data Summary

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Certificate of Analysis

Report Date: July 8, 2014

Company : Tetra Tech Inc.
Address : 415 Oak Street

Kansas City, Missouri 64106

Contact: Mr. Danny O'Connor
Project: C14 Analysis for BetaChem Site

Client Sample ID:	Bulked Flammables	Project:	TETR00056
Sample ID:	351556002	Client ID:	TETR056
Matrix:	Oil		
Collect Date:	23-JUN-14 11:00		
Receive Date:	28-JUN-14		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time Batch	Method
Semi-Volatile-GC/MS										
TCLP SVOCs- 1311/3580A/8270D "As Received"										
1,4-Dichlorobenzene	U	ND	594000	1980000	ug/L	20	JMB3	07/07/14	2234 1400389	1
2,4,5-Trichlorophenol	U	ND	594000	1980000	ug/L	20				
2,4,6-Trichlorophenol	U	ND	594000	1980000	ug/L	20				
2,4-Dinitrotoluene	U	ND	594000	1980000	ug/L	20				
Hexachlorobenzene	U	ND	594000	1980000	ug/L	20				
Hexachlorobutadiene	U	ND	594000	1980000	ug/L	20				
Hexachloroethane	U	ND	594000	1980000	ug/L	20				
Nitrobenzene	U	ND	594000	1980000	ug/L	20				
Pentachlorophenol	U	ND	594000	1980000	ug/L	20				
PYRIDINE		10900000	594000	1980000	ug/L	20				
CRESOLS, M & P	U	ND	733000	1980000	ug/L	20				
2-Methylphenol	U	ND	594000	1980000	ug/L	20				

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 1311	SW846 1311 TCLP Leaching	RXD2	06/30/14	1447	1400302
SW846 3580A	3580A BNA Prep for Oil (HT from previous)	CXR2	07/07/14	1750	1400388

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3580A/8270D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2-Fluorobiphenyl	TCLP SVOCs- 1311/3580A/8270D "As Received"	566000 ug/L	495000	114*	(32%-102%)
Nitrobenzene-d5	TCLP SVOCs- 1311/3580A/8270D "As Received"	550000 ug/L	495000	111	(36%-125%)
Terphenyl-d14	TCLP SVOCs- 1311/3580A/8270D "As Received"	489000 ug/L	495000	98.8	(34%-135%)
2,4,6-Tribromophenol	TCLP SVOCs- 1311/3580A/8270D "As Received"	768000 ug/L	990000	77.6	(26%-129%)
2-Fluorophenol	TCLP SVOCs- 1311/3580A/8270D "As Received"	1190000 ug/L	990000	120*	(10%-78%)
PHENOL-D6	TCLP SVOCs- 1311/3580A/8270D "As Received"	1110000 ug/L	990000	113*	(10%-104%)

Notes:

Quality Control Summary

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QC Summary

Report Date: July 8, 2014

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Tetra Tech Inc.
415 Oak Street
Kansas City, Missouri
Contact: Mr. Danny O'Connor

Workorder: 351556

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1400389										
QC1203120351	LCS										
1,4-Dichlorobenzene	171000			172000	ug/L		101 *	(24%-88%)	JMB3	07/07/14	20:34
2,4,5-Trichlorophenol	342000			309000	ug/L		90.5	(41%-111%)			
2,4,6-Trichlorophenol	342000			313000	ug/L		91.5	(41%-109%)			
2,4-Dinitrotoluene	171000			153000	ug/L		89.4	(45%-124%)			
2-Methylphenol	342000			349000	ug/L		102 *	(32%-90%)			
CRESOLS, M & P	342000			390000	ug/L		114 *	(28%-100%)			
Hexachlorobenzene	171000			164000	ug/L		95.7	(43%-116%)			
Hexachlorobutadiene	171000			162000	ug/L		94.6 *	(19%-92%)			
Hexachloroethane	171000			179000	ug/L		105 *	(20%-85%)			
Nitrobenzene	171000			153000	ug/L		89.6	(41%-119%)			
PYRIDINE	171000			191000	ug/L		112 *	(11%-88%)			
Pentachlorophenol	342000			259000	ug/L		75.8	(27%-102%)			
**2,4,6-Tribromophenol	855000			825000	ug/L		96.5	(26%-129%)			
**2-Fluorobiphenyl	427000			355000	ug/L		83.1	(32%-102%)			
**2-Fluorophenol	855000			771000	ug/L		90.2 *	(10%-78%)			
**Nitrobenzene-d5	427000			377000	ug/L		88.3	(36%-125%)			
**PHENOL-D6	855000			771000	ug/L		90.2	(10%-104%)			
**Terphenyl-d14	427000			317000	ug/L		74.1	(34%-135%)			
QC1203120348	MB										
1,4-Dichlorobenzene			U	ND	ug/L					07/07/14	19:34
2,4,5-Trichlorophenol			U	ND	ug/L						

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QC Summary

Workorder: 351556

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1400389										
2,4,6-Trichlorophenol			U	ND	ug/L				JMB3	07/07/14	19:34
2,4-Dinitrotoluene			U	ND	ug/L						
2-Methylphenol			U	ND	ug/L						
CRESOLS, M & P			U	ND	ug/L						
Hexachlorobenzene			U	ND	ug/L						
Hexachlorobutadiene			U	ND	ug/L						
Hexachloroethane			U	ND	ug/L						
Nitrobenzene			U	ND	ug/L						
PYRIDINE			U	ND	ug/L						
Pentachlorophenol			U	ND	ug/L						
**2,4,6-Tribromophenol	855000			860000	ug/L		101	(26%-129%)			
**2-Fluorobiphenyl	427000			409000	ug/L		95.7	(32%-102%)			
**2-Fluorophenol	855000			864000	ug/L		101 *	(10%-78%)			
**Nitrobenzene-d5	427000			423000	ug/L		98.9	(36%-125%)			
**PHENOL-D6	855000			844000	ug/L		98.7	(10%-104%)			
**Terphenyl-d14	427000			393000	ug/L		91.9	(34%-135%)			
QC1203120349 351556002 MS											
1,4-Dichlorobenzene	175000	U	ND	U	ND	ug/L	0 *	(20%-86%)		07/07/14	23:04
2,4,5-Trichlorophenol	351000	U	ND	U	ND	ug/L	0 *	(30%-117%)			
2,4,6-Trichlorophenol	351000	U	ND	U	ND	ug/L	0 *	(31%-113%)			
2,4-Dinitrotoluene	175000	U	ND	U	ND	ug/L	0 *	(34%-126%)			
2-Methylphenol	351000	U	ND	U	ND	ug/L	0 *	(26%-97%)			

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QC Summary

Workorder: 351556

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1400389										
CRESOLS, M & P	351000	U	ND	U	ND	ug/L	0 *	(24%-110%)	JMB3	07/07/14	23:04
Hexachlorobenzene	175000	U	ND	U	ND	ug/L	0 *	(33%-115%)			
Hexachlorobutadiene	175000	U	ND	U	ND	ug/L	0 *	(11%-97%)			
Hexachloroethane	175000	U	ND	U	ND	ug/L	0 *	(17%-82%)			
Nitrobenzene	175000	U	ND	U	ND	ug/L	0 *	(32%-126%)			
PYRIDINE	175000		10900000		11300000	ug/L	N/A	(14%-94%)			
Pentachlorophenol	351000	U	ND	U	ND	ug/L	0 *	(19%-112%)			
**2,4,6-Tribromophenol	877000		768000		812000	ug/L	92.6	(26%-129%)			
**2-Fluorobiphenyl	439000		566000		509000	ug/L	116 *	(32%-102%)			
**2-Fluorophenol	877000		1190000		1060000	ug/L	121 *	(10%-78%)			
**Nitrobenzene-d5	439000		550000		489000	ug/L	112	(36%-125%)			
**PHENOL-D6	877000		1110000		1020000	ug/L	116 *	(10%-104%)			
**Terphenyl-d14	439000		489000		453000	ug/L	103	(34%-135%)			
QC1203120350	351556002	MSD									
1,4-Dichlorobenzene	174000	U	ND	U	ND	ug/L	N/A	0 *	(0%-30%)	07/07/14	23:34
2,4,5-Trichlorophenol	348000	U	ND	U	ND	ug/L	N/A	0 *	(0%-30%)		
2,4,6-Trichlorophenol	348000	U	ND	U	ND	ug/L	N/A	0 *	(0%-30%)		
2,4-Dinitrotoluene	174000	U	ND	U	ND	ug/L	N/A	0 *	(0%-30%)		
2-Methylphenol	348000	U	ND	U	ND	ug/L	N/A	0 *	(0%-30%)		
CRESOLS, M & P	348000	U	ND	U	ND	ug/L	N/A	0 *	(0%-30%)		
Hexachlorobenzene	174000	U	ND	U	ND	ug/L	N/A	0 *	(0%-30%)		
Hexachlorobutadiene	174000	U	ND	U	ND	ug/L	N/A	0 *	(0%-30%)		

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QC Summary

Workorder: 351556

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1400389										
Hexachloroethane	174000	U	ND	U	ND	ug/L	N/A	0 *	(0%-30%)	JMB3	07/07/14 23:34
Nitrobenzene	174000	U	ND	U	ND	ug/L	N/A	0 *	(0%-30%)		
PYRIDINE	174000		10900000		10100000	ug/L	11.4	N/A	(0%-30%)		
Pentachlorophenol	348000	U	ND	U	ND	ug/L	N/A	0 *	(0%-30%)		
**2,4,6-Tribromophenol	870000		768000		824000	ug/L		94.8	(26%-129%)		
**2-Fluorobiphenyl	435000		566000		449000	ug/L		103 *	(32%-102%)		
**2-Fluorophenol	870000		1190000		944000	ug/L		109 *	(10%-78%)		
**Nitrobenzene-d5	435000		550000		452000	ug/L		104	(36%-125%)		
**PHENOL-D6	870000		1110000		913000	ug/L		105 *	(10%-104%)		
**Terphenyl-d14	435000		489000		374000	ug/L		86	(34%-135%)		
QC1203120172 TB											
1,4-Dichlorobenzene			U		ND	ug/L					07/07/14 20:04
2,4,5-Trichlorophenol			U		ND	ug/L					
2,4,6-Trichlorophenol			U		ND	ug/L					
2,4-Dinitrotoluene			U		ND	ug/L					
2-Methylphenol			U		ND	ug/L					
CRESOLS, M & P			U		ND	ug/L					
Hexachlorobenzene			U		ND	ug/L					
Hexachlorobutadiene			U		ND	ug/L					
Hexachloroethane			U		ND	ug/L					
Nitrobenzene			U		ND	ug/L					
PYRIDINE			U		ND	ug/L					

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QC Summary

Workorder: 351556

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1400389										
Pentachlorophenol			U	ND	ug/L				JMB3	07/07/14	20:04
**2,4,6-Tribromophenol	952000			889000	ug/L		93.3	(26%-129%)			
**2-Fluorobiphenyl	476000			425000	ug/L		89.3	(32%-102%)			
**2-Fluorophenol	952000			930000	ug/L		97.7 *	(10%-78%)			
**Nitrobenzene-d5	476000			449000	ug/L		94.3	(36%-125%)			
**PHENOL-D6	952000			917000	ug/L		96.3	(10%-104%)			
**Terphenyl-d14	476000			433000	ug/L		91	(34%-135%)			

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B The target analyte was detected in the associated blank.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- E Concentration of the target analyte exceeds the instrument calibration range
- H Analytical holding time was exceeded
- J Value is estimated
- JNX Non Calibrated Compound
- N Organics--Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
- N Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- P Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, the difference is >70%.
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.

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QC Summary

Workorder: 351556

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
R	Sample results are rejected										
U	Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.										
UJ	Compound cannot be extracted										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	QC Samples were not spiked with this compound										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
h	Preparation or preservation holding time was exceeded										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

DATA EXCEPTION REPORT

Mo.Day Yr. 08-JUL-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: SEMIVOA GC/MS	Test / Method: SW846 3580A/8270D	Matrix Type: Solid	Client Code: TETR
Batch ID: 1400389	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 351556 Application Issues: Failed Recovery for MS/PS Failed Recovery for LCS/LCSD Failed Yield for Surrogates Failed Recovery for MSD/PSD			
Specification and Requirements Exception Description:		DER Disposition:	
1. The TB (1203120172), MB (1203120348), and LCS (1203120351) exceeded surrogate SPC limits. Please see the QC Summary/Surrogate Recovery Report for specific failures. 2. The TETR (351556002), MS (1203120349), and MSD (1203120350) failed surrogate recovery limits. Please see the QC Summary/Surrogate Recovery Report for specific failures. 3. The LCS (1203120351) exceeded spike SPC limits. Please see the QC Summary/Spike Recovery Report for specific failures. 4. The MS (1203120349) and MSD (1203120350) failed spike recovery limits. Please see the QC Summary/Spike Recovery Report for specific failures.		1. The samples were waste dilution analyses. They were diluted to a known volume and analyzed directly. Because they were not extracted (extracted compounds may be consumed or lost during the process), the recoveries are typically higher. The data are reported. 2. Surrogate recoveries were not within the acceptance limit. The associated spike and spike duplicate recovered in a similar manner. Matrix interference has been demonstrated and the samples were analyzed at a further dilution. The data are reported. 3. The sample was a waste dilution analysis. It was diluted to a known volume and analyzed directly. Because it was not extracted (extracted compounds may be consumed or lost during the process), the recoveries are typically higher. The data are reported. 4. As the MS and MSD displayed similar recoveries, the failures were attributed to sample matrix interference and the samples were analyzed at a further dilution. The data are reported.	

Originator's Name:

Josh Brooks

08-JUL-14

Data Validator/Group Leader:

Herbert Maier

08-JUL-14

PCB Analysis

Case Narrative

**PCB Case Narrative
Tetra Tech, Inc. (TETR)
SDG 351556**

Method/Analysis Information

Procedure:	Analysis of Polychlorinated Biphenyls by ECD
Analytical Method:	SW846 3580A/8082A
Prep Method:	SW846 3580A
Analytical Batch Number:	1399873
Prep Batch Number:	1399871

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3580A/8082A:

Sample ID	Client ID
351556002	Bulked Flammables
1203119155	Method Blank (MB)
1203119156	Laboratory Control Sample (LCS)
1203119157	351556002(Bulked Flammables) Matrix Spike (MS)
1203119158	351556002(Bulked Flammables) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-040 REV# 20.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification (CCV) Requirements

All associated calibration verification standards (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

All surrogate recoveries were within the established acceptance criteria for the samples in this SDG in this batch.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 351556002 (Bulked Flammables) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries for this SDG were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recoveries for this SDG were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD between the MS and MSD met the acceptance limits.

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns. All sample extracts were cleaned using alumina.

Sample Dilutions

Samples 1203119157 (Bulked FlammablesMS), 1203119158 (Bulked FlammablesMSD) and 351556002 (Bulked Flammables) were diluted due to high concentrations of non-target analytes within the retention time window of interest.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG in this batch.

Miscellaneous Information

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand

written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation

Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

Manual Integrations

Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections.

Additional Comments

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The front column has been chosen as the primary column. The data are reported from the front column for all samples in this batch.

System Configuration

The Semi-Volatiles-PCB analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
ECD9A.I_1	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 1	30m x 0.25mm, 0.25um
ECD9A.I_2	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 2	30m x 0.25mm, 0.20um

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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Qualifier Definition Report for

TETR056 Tetra Tech, Inc. (BetaChem 1105919)

Client SDG: 351556 GEL Work Order: 351556

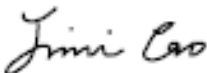
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Jimin Cao

Date: 07 JUL 2014

Title: Data Validator

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: July 7, 2014

Company : Tetra Tech Inc.
Address : 415 Oak Street

Kansas City, Missouri 64106

Contact: Mr. Danny O'Connor
Project: C14 Analysis for BetaChem Site

Client Sample ID: Bulkled Flammables

Project: TETR00056

Sample ID: 351556002

Client ID: TETR056

Matrix: Oil

Collect Date: 23-JUN-14 11:00

Receive Date: 28-JUN-14

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB											
SW846 8082A/3580A PCB Waste Dilution "As Received"											
Aroclor-1016	U	ND	647	1940	ug/kg	2	YS1	07/03/14	1132	1399873	1
Aroclor-1221	U	ND	647	1940	ug/kg	2					
Aroclor-1232	U	ND	647	1940	ug/kg	2					
Aroclor-1242	U	ND	647	1940	ug/kg	2					
Aroclor-1248	U	ND	647	1940	ug/kg	2					
Aroclor-1254	U	ND	647	1940	ug/kg	2					
Aroclor-1260	U	ND	647	1940	ug/kg	2					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3580A	3580A PCB Prep for Oil	SXS3	07/03/14	0820	1399871

The following Analytical Methods were performed:

Method	Description	Analyst Comments				
1	SW846 3580A/8082A					

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 8082A/3580A PCB Waste Dilution "As Received"	1930 ug/kg	1940	99.2	(29%-127%)
DECACHLOROBIPHENYL	SW846 8082A/3580A PCB Waste Dilution "As Received"	2220 ug/kg	1940	115	(30%-140%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: July 7, 2014

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Tetra Tech Inc.
415 Oak Street
Kansas City, Missouri
Mr. Danny O'Connor

Contact:
Workorder: 351556

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-PCB											
Batch	1399873										
QC1203119156	LCS										
Aroclor-1016	10000			10400	ug/kg		104	(46%-134%)	YS1	07/03/14	11:21
Aroclor-1260	10000			9440	ug/kg		94.4	(54%-146%)			
**4cmx	2000			2110	ug/kg		106	(29%-127%)			
**DECACHLOROBIPHENYL	2000			2040	ug/kg		102	(30%-140%)			
QC1203119155	MB										
Aroclor-1016			U	ND	ug/kg					07/03/14	11:09
Aroclor-1221			U	ND	ug/kg						
Aroclor-1232			U	ND	ug/kg						
Aroclor-1242			U	ND	ug/kg						
Aroclor-1248			U	ND	ug/kg						
Aroclor-1254			U	ND	ug/kg						
Aroclor-1260			U	ND	ug/kg						
**4cmx	2000			2100	ug/kg		105	(29%-127%)			
**DECACHLOROBIPHENYL	2000			2030	ug/kg		102	(30%-140%)			
QC1203119157	351556002	MS									
Aroclor-1016	9900	U	ND	11300	ug/kg		114	(33%-130%)		07/03/14	11:45
Aroclor-1260	9900	U	ND	10800	ug/kg		109	(32%-137%)			
**4cmx	1980		1930	2030	ug/kg		102	(29%-127%)			
**DECACHLOROBIPHENYL	1980		2220	2390	ug/kg		121	(30%-140%)			
QC1203119158	351556002	MSD									
Aroclor-1016	9350	U	ND	11100	ug/kg	1.62	119	(0%-30%)		07/03/14	11:59
Aroclor-1260	9350	U	ND	10200	ug/kg	5.71	109	(0%-30%)			

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QC Summary

Workorder: 351556

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-PCB											
Batch	1399873										
**4cmx	1870	1930		1960	ug/kg		105	(29%-127%)	YS1	07/03/14	11:59
**DECACHLOROBIPHENYL	1870	2220		2230	ug/kg		119	(30%-140%)			

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B The target analyte was detected in the associated blank.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- E Concentration of the target analyte exceeds the instrument calibration range
- H Analytical holding time was exceeded
- J Value is estimated
- JNX Non Calibrated Compound
- N Organics--Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
- N Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- P Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, the difference is >70%.
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UJ Compound cannot be extracted
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

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QC Summary

Workorder: 351556

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
----------	-----	--------	------	----	-------	------	------	-------	-------	------	------

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Metals Analysis

Case Narrative

**Metals Fractional Narrative
Tetra Tech, Inc. (TETR)
SDG 351556**

Sample Analysis

Sample ID	Client ID
351556001	Bulked Flammables
1203118113	Tumbling Blank (TB)
1203118881	Method Blank (MB) ICP
1203118882	Laboratory Control Sample (LCS)
1203118885	351556001(Bulked FlammablesL) Serial Dilution (SD)
1203118883	351556001(Bulked FlammablesD) Sample Duplicate (DUP)
1203118884	351556001(Bulked FlammablesS) Matrix Spike (MS)
1203118113	Tumbling Blank (TB)
1203118936	Method Blank (MB) CVAA
1203118937	Laboratory Control Sample (LCS)
1203118940	351556001(Bulked FlammablesL) Serial Dilution (SD)
1203118938	351556001(Bulked FlammablesD) Sample Duplicate (DUP)
1203118939	351556001(Bulked FlammablesS) Matrix Spike (MS)

The samples in this SDG were analyzed on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1399757 and 1399790
Prep Batch :	1399756 and 1399788
TCLP Prep Batch :	1399522
Standard Operating Procedures:	GL-MA-E-013 REV# 22, GL-MA-E-008 REV# 16, GL-LB-E-006 REV# 19 and GL-MA-E-010 REV# 28
Analytical Method:	SW846 3010A/6010C and SW846 7470A
Prep Method :	SW846 3010A and SW846 7470A Prep
TCLP Prep Method :	SW846 1311

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 0.4L/min, argon gas flows of 13 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL/PQL Requirements

The CRDL/PQL standard recoveries met the referenced advisory control limits.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blanks (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 351556001 (Bulked Flammables)-ICP and CVAA.

Matrix Spike (MS) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable analytes met the acceptance criteria.

Duplicate Relative Percent Difference (RPD) Statement

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of RL is used to evaluate the DUP results. All applicable analytes met these requirements.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the established acceptance percent difference criteria.

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. The samples in this SDG did not require dilutions.

Preparation Information

The sample 351556001 (Bulked Flammables)-ICP in this SDG was prepared at a ten times dilution factor due to the miscellaneous liquid classification. The samples were prepped at 1000x dilution to due oil matrix. CVAA.

Miscellaneous Information

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception reports were included behind the Case Narrative or in the Miscellaneous Data section of this data package. A data exception report was required for this SDG: 1309925.

Additional Comments

Additional comments were not required for this SDG.

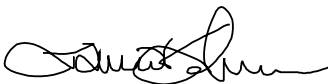
Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer:  **Date:** 7/3/14

Sample Data Summary

GEL LABORATORIES LLC

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Qualifier Definition Report for

TETR056 Tetra Tech, Inc. (BetaChem 1105919)

Client SDG: 351556 GEL Work Order: 351556

The Qualifiers in this report are defined as follows:

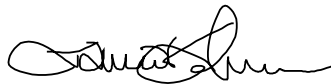
- * A quality control analyte recovery is outside of specified acceptance criteria
- B Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Heather Shaffer.

Reviewed by



7/3/14

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: July 4, 2014

Company : Tetra Tech Inc.
Address : 415 Oak Street

Kansas City, Missouri 64106

Contact: Mr. Danny O'Connor
Project: C14 Analysis for BetaChem Site

Client Sample ID: Bulkled Flammables
Sample ID: 351556001
Matrix: Misc Liquid
Collect Date: 23-JUN-14 11:00
Receive Date: 28-JUN-14
Collector: Client

Project: TETR00056
Client ID: TETR056

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
TCLP Hg in Liquid "As Received"											
Mercury	U	ND	0.067	0.200	mg/L	1	MTM1	07/01/14	1020	1399790	1
Metals Analysis-ICP											
TCLP ICP Metals - 1311/3010A/6010C "As Received"											
Arsenic	U	ND	0.250	1.50	mg/L	1	TXT1	07/03/14	1308	1399757	2
Barium	U	ND	0.050	0.250	mg/L	1					
Cadmium	U	ND	0.050	0.250	mg/L	1					
Chromium	U	ND	0.050	0.250	mg/L	1					
Lead	U	ND	0.165	0.500	mg/L	1					
Selenium	J	0.382	0.300	1.50	mg/L	1					
Silver	U	ND	0.050	0.250	mg/L	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 1311	SW846 1311 TCLP Leaching	MXC2	06/30/14	1425	1399522
SW846 3010A	ICP-TRACE TCLP by SW846 3010A	JXM5	07/01/14	0800	1399756
SW846 7470A Prep	EPA 7470A Mercury Prep TCLP Liquid	AXS5	07/01/14	0800	1399788

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3010A/6010C	

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: July 4, 2014

Company : Tetra Tech Inc.
Address : 415 Oak Street

Contact: Kansas City, Missouri 64106
Project: Mr. Danny O'Connor
C14 Analysis for BetaChem Site

Client Sample ID: Bulkled Flammables
Sample ID: 351556002
Matrix: Oil
Collect Date: 23-JUN-14 11:00
Receive Date: 28-JUN-14
Collector: Client

Project: TETR00056
Client ID: TETR056

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time Batch	Method
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Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: July 4, 2014

Page 1 of 4

Tetra Tech Inc.
415 Oak Street
Kansas City, Missouri
Contact: Mr. Danny O'Connor

Workorder: 351556

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1399757										
QC1203118883	351556001	DUP									
Arsenic	U	ND	U	ND	mg/L	N/A			TXT1	07/03/14	13:11
Barium	U	ND	U	ND	mg/L	N/A					
Cadmium	U	ND	U	ND	mg/L	N/A					
Chromium	U	ND	U	ND	mg/L	N/A					
Lead	U	ND	J	0.181	mg/L	200					
Selenium	J	0.382	J	0.334	mg/L	13.4	^	(+/-1.50)			
Silver	U	ND	U	ND	mg/L	N/A					
QC1203118882	LCS										
Arsenic	5.00			4.57	mg/L		91.4	(80%-120%)		07/03/14	13:06
Barium	5.00			4.94	mg/L		98.9	(80%-120%)			
Cadmium	5.00			4.77	mg/L		95.4	(80%-120%)			
Chromium	5.00			4.96	mg/L		99.3	(80%-120%)			
Lead	5.00			4.90	mg/L		98	(80%-120%)			
Selenium	5.00			4.16	mg/L		83.2	(80%-120%)			
Silver	5.00			4.84	mg/L		96.8	(80%-120%)			
QC1203118881	MB										
Arsenic			U	ND	mg/L					07/03/14	12:58
Barium			U	ND	mg/L						
Cadmium			U	ND	mg/L						
Chromium			U	ND	mg/L						
Lead			U	ND	mg/L						

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QC Summary

Workorder: 351556

Page 2 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1399757										
Selenium			J	0.0773	mg/L						
Silver			U	ND	mg/L				TXT1	07/03/14	12:58
QC1203118884 351556001 MS											
Arsenic	25.0	U	ND	23.6	mg/L		94.2	(75%-125%)		07/03/14	13:14
Barium	25.0	U	ND	25.1	mg/L		100	(75%-125%)			
Cadmium	25.0	U	ND	24.9	mg/L		99.8	(75%-125%)			
Chromium	25.0	U	ND	25.3	mg/L		101	(75%-125%)			
Lead	25.0	U	ND	24.9	mg/L		99.4	(75%-125%)			
Selenium	25.0	J	0.382	24.0	mg/L		94.5	(75%-125%)			
Silver	25.0	U	ND	24.5	mg/L		97.9	(75%-125%)			
QC1203118885 351556001 SDILT											
Arsenic		U	ND	U	ND	ug/L	N/A	(0%-10%)		07/03/14	13:17
Barium		U	ND	U	ND	ug/L	N/A	(0%-10%)			
Cadmium		U	ND	U	ND	ug/L	N/A	(0%-10%)			
Chromium		U	ND	U	ND	ug/L	N/A	(0%-10%)			
Lead		U	ND	U	ND	ug/L	N/A	(0%-10%)			
Selenium		J	7.64	U	ND	ug/L	N/A	(0%-10%)			
Silver		U	ND	U	ND	ug/L	N/A	(0%-10%)			
QC1203118113 TB											
Arsenic			U	ND	mg/L					07/03/14	13:02
Barium			U	ND	mg/L						
Cadmium			U	ND	mg/L						
Chromium			U	ND	mg/L						
Lead			U	ND	mg/L						

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QC Summary

Workorder: 351556

Page 3 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1399757										
Selenium			J	0.0761	mg/L						
Silver			U	ND	mg/L				TXT1	07/03/14	13:02
Metals Analysis-Mercury											
Batch	1399790										
QC1203118938	351556001	DUP									
Mercury		U	ND	U	ND	mg/L	N/A		MTM1	07/01/14	10:22
QC1203118937	LCS										
Mercury		2.00			2.08	mg/L		104	(80%-120%)		07/01/14 10:19
QC1203118936	MB										
Mercury			U		ND	mg/L					07/01/14 10:15
QC1203118939	351556001	MS									
Mercury		2.00	U	ND		2.03	mg/L		101	(75%-125%)	07/01/14 10:24
QC1203118940	351556001	SDILT									
Mercury			U	ND	U	ND	ug/L	N/A		(0%-10%)	07/01/14 10:25
QC1203118113	TB										
Mercury			U		ND	mg/L					07/01/14 10:17

Notes:

The Qualifiers in this report are defined as follows:

- < Result is less than value reported
- > Result is greater than value reported
- E %difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- FB Mercury was found present at quantifiable concentrations in field blanks received with these samples. Data associated with the blank are deemed invalid for reporting to regulatory agencies
- H Analytical holding time was exceeded
- J Value is estimated
- N Metals--The Matrix spike sample recovery is not within specified control limits
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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QC Summary

Workorder: 351556

Page 4 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
h	Preparation or preservation holding time was exceeded										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 30-JUN-14	Division:	Quality Criteria: SOP	Type: Process
Instrument Type: MANUAL	Test / Method: SW846 1311	Matrix Type: Liquid	Client Code: TETR
Batch ID: 1399522	Sample Numbers: 351556001		
Potentially affected work order(s)(SDG): 351556 Application Issues: Spiking and preservation occurred in Metals Digestion Lab			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Spiking and preservation occurred in Metals Digestion Lab		1. Spiking and preservation occurred in Metals Digestion Lab due to sample insolubility in water.	

Originator's Name:
Marshall Chew 30-JUN-14

Data Validator/Group Leader:
Edmund Frampton 30-JUN-14

General Chem Analysis

Case Narrative

**General Chemistry Narrative
Tetra Tech, Inc. (TETR)
SDG 351556**

Method/Analysis Information

Product:	Heating Value by Bomb Calorimeter (BTU)	
Analytical Batch:	1399673	Method: ASTMD 240 Heating Value Bomb

Sample Analysis

The following samples were analyzed using the analytical protocol as established in ASTM D 240-87:

Sample ID	Client ID
351556001	Bulked Flammables
1203118584	351556001(Bulked Flammables) Sample Duplicate (DUP)
1203118585	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-048 REV# 8.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Hazardous Waste analysis was performed on a Parr 1261.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 351556001 (Bulked Flammables).

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information**Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Total Halogens by Bomb Calorimeter

Analytical Batch: 1399671

Method: ASTM D808 Total Halogen Bomb

Sample Analysis

The following samples were analyzed using the analytical protocol as established in ASTM D 808:

Sample ID	Client ID
351556001	Bulked Flammables
1203118582	351556001(Bulked Flammables) Sample Duplicate (DUP)
1203118583	Laboratory Control Sample (LCS)
1203120014	Method Blank (MB)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-098 REV# 6.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Hazardous Waste analysis was performed on a Parr 1261.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 351556001 (Bulked Flammables).

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Flashpoint by Setaflash

Analytical Batch: 1399675

Method: SW1020B Setaflash Flash Point 200

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 1020B:

Sample ID	Client ID
351556001	Bulked Flammables
1203118601	Laboratory Control Sample (LCS)
1203119673	351482002(TSBB104W-01) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-066 REV# 12.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Hazardous Waste analysis was performed on a Setaflash Flashpoint Rapid Tester.

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 351482002 (TSBB104W-01).

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information**Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: pH_by_strip

Analytical Batch: 1400110 **Method:** SW846 9041A pH (strip)

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9041A:

Sample ID	Client ID
351556001	Bulked Flammables
1203119762	351434001(S35437) Sample Duplicate (DUP)
1203119763	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 21.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Titration and Ion analysis was not performed on an analytical instrument.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information**Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1311509. 1203119762 (S35437) and 351556001 (Bulked Flammables).

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Certification Statement

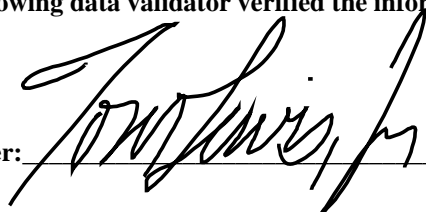
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer:



Date:

07July14

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis Report for

TETR056 Tetra Tech, Inc. (BetaChem 1105919)

Client SDG: 351556 GEL Work Order: 351556

The Qualifiers in this report are defined as follows:

* A quality control analyte recovery is outside of specified acceptance criteria

H Analytical holding time was exceeded

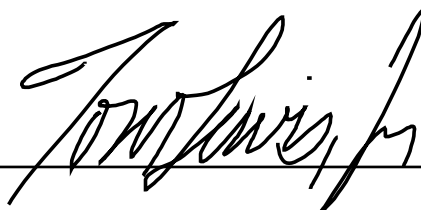
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Heather Shaffer.

Reviewed by

A handwritten signature in black ink, appearing to read "Tom Lewis", is written over a horizontal line.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 7, 2014

Company : Tetra Tech Inc.
Address : 415 Oak Street

Kansas City, Missouri 64106

Contact: Mr. Danny O'Connor
Project: C14 Analysis for BetaChem Site

Client Sample ID: Bulkled Flammables
Sample ID: 351556001
Matrix: Misc Liquid
Collect Date: 23-JUN-14 11:00
Receive Date: 28-JUN-14
Collector: Client

Project: TETR00056
Client ID: TETR056

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Hazardous Waste											
ASTM D808 Total Halogen Bomb "As Received"											
Total Halogens	U	ND	0.033	0.100	wt%	1	MXB3	07/02/14	1058	1399671	1
ASTMD 240 Heating Value Bomb "As Received"											
Heating Value		11200	200	200	BTU/lb	1	MXB3	07/01/14	1341	1399673	2
SW1020B Setaflash Flash Point 200 "As Received"											
Setaflash-200		>200	75.0	75.0	Fahrenheit	1	MXB3	07/01/14	1642	1399675	3
Titration and Ion Analysis											
SW846 9041A pH (strip) "As Received"											
PH	H	9.00	0.010	0.100	SU	1	PXO1	07/05/14	1715	1400110	4

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	ASTM D 808	
2	ASTM D 240-87	
3	SW846 1020B	
4	SW846 9041A	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: July 7, 2014

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Tetra Tech Inc.
415 Oak Street
Kansas City, Missouri
Mr. Danny O'Connor

Contact:

Workorder: 351556

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Hazardous Waste											
Batch	1399671										
QC1203118582	351556001	DUP									
Total Halogens		U	ND	U	ND	wt%	N/A		MXB3	07/02/14	11:14
QC1203118583	LCS										
Total Halogens	17.4				16.7	wt%	96.4	(79%-115%)		07/02/14	10:45
QC1203120014	MB										
Total Halogens			U		ND	wt%				07/02/14	09:47
Batch	1399673										
QC1203118584	351556001	DUP									
Heating Value		11200			10100	BTU/lb	10.6	(0%-20%)	MXB3	07/01/14	14:26
QC1203118585	LCS										
Heating Value	11400				11300	BTU/lb	99.2	(90%-110%)		07/01/14	12:52
Batch	1399675										
QC1203119673	351482002	DUP									
Setaflash-200		>200			>200	Fahrenheit	0.00	(0%-9%)	MXB3	07/01/14	16:29
QC1203118601	LCS										
Setaflash-200	81.0				82.0	Fahrenheit	101	(97%-103%)		07/01/14	15:30
Titration and Ion Analysis											
Batch	1400110										
QC1203119762	351434001	DUP									
PH		H	10.0	H	10.0	SU	0.00	(0%-10%)	PXO1	07/05/14	17:15
QC1203119763	LCS										
PH	7.00				7.00	SU	100	(99%-101%)		07/05/14	17:08

Notes:

The Qualifiers in this report are defined as follows:

- < Result is less than value reported
- > Result is greater than value reported
- B The target analyte was detected in the associated blank.
- E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
- H Analytical holding time was exceeded
- J Value is estimated

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
N/A	RPD or %Recovery limits do not apply.										
N1	See case narrative										
ND	Analyte concentration is not detected above the detection limit										
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.										
R	Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.										
R	Sample results are rejected										
U	Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
d	5-day BOD--The 2:1 depletion requirement was not met for this sample										
e	5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes										
h	Preparation or preservation holding time was exceeded										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 07-JUL-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: MANUAL	Test / Method: SW846 9041A	Matrix Type: Liquid	Client Code: LBNL, TETR
Batch ID: 1400110	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 351434(W5098),351556 Application Issues: Sample received out of holding			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Sample received out of holding: 351434 001 351556 001		1. Samples were received by laboratory out of method specified holding time.	

Originator's Name:

Sarah Carson 07-JUL-14

Data Validator/Group Leader:

Elzbieta Szulc 07-JUL-14